

Application Number 10/532322
Response to the Office Action dated October 17, 2008

REMARKS

Favorable reconsideration of this application is requested in view of the following remarks.

Non-elected claims 57-62 have been canceled without prejudice.

Claim 33 has been amended to include limitations of previously presented claims 36 and 45 and limitations as supported by the specification at page 10, lines 2-3 with editorial revisions. According to inclusion of the limitations of claim 45 in claim 33, a part of limitations of claim 34 has been added to claim 33, and the part of the limitations of claim 34 has been deleted from claim 34. Claims 36 and 45 have been canceled without prejudice. Claim 39 has been amended to clarify that the other fiber of claim 33 is an olefin fiber as supported by the specification at page 14, lines 27-29. Claims 40 and 41 have been amended as supported by the specification at page 15, lines 19-21 and page 16, lines 3-6, respectively, with editorial revisions. Claims 41, 43, 46, 47, 48, 49, and 50 have been amended editorially.

Claim 39 has been objected to because of informalities. Claim 39 has been amended to clarity that the other fiber included in the nonwoven is an olefin fiber. Accordingly, it is clear that the nonwoven includes both the heat-and-humidity gelling resin and the olefin fiber, and this objection should be withdrawn.

Claims 40, 41, 43, 47, and 48 have been objected to because of informalities. Claims 40, 41, 43, 47, and 48 have been amended to clarify that 100 parts by mass of the heat-and-humidity gelling resin is included in the nonwoven by removing the word "assumed to be". Accordingly, this objection should be withdrawn.

Claims 33-56 and 63 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants respectfully traverse this rejection.

Application Number 10/532322
Response to the Office Action dated October 17, 2008

In claim 33, the mean flow pore diameter limits an average pore size to 0.3 – 5 µm, and the bubble point pore diameter limits a maximum pore size to 3-20 µm. When a number of pores with larger diameters is small, the average diameter can be much smaller than the number of the maximum diameter, i.e., this claim shows that a distribution of pore sizes is shifted to the smaller side relative to the maximum pore size. Thus, claim 33 is clear.

As discussed above, claim 39 has been amended to clarify that the other fiber included in the nonwoven is an olefin fiber, and that the nonwoven includes both the heat-and-humidity gelling resin and the olefin fiber. Thus, claim 39 is definite.

Claim 48 has been amended to remove the antecedent basis issues by eliminating the definite article in addition to the other editorial revisions. Thus, claim 48 is definite.

Claim 49 also has been amended to remove the definite article, and there are no antecedent basis issues. Thus, claim 49 is definite.

Claim 50 has been amended to remove the definite article and include the definition of the splittable composite fiber. Thus, claim 50 is definite.

Accordingly, this rejection should be withdrawn.

Claims 33-34, 49-51, 53-56, and 63 have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tsukuda et al. (International Patent Application Publication No. WO 98/32184), which corresponds to U.S. Patent No. 6,511,774, as evidenced by Bahar et al. (U.S. Patent No. 5,599,614). Applicants respectfully traverse this rejection.

Tsukuda discloses a separator for non-aqueous electrolyte batteries including a porous base made of nonwoven fabric containing organic fibers and a paper, and that the organic fibers in the nonwoven fabric may be made of an ethylene-vinyl alcohol copolymer (see coln. 7, lines 38-43 and coln. 8, lines 8-15 of U.S. Patent No. 6,511,774). Tsukuda, however, fails to disclose that the ethylene content in the ethylene-vinyl alcohol copolymer is 20-50 mol% as claim 33 requires. In addition, Tsukuda does not disclose the particular diameter of the heat-and-humidity gelling fiber of 1-6 µm as claim 33 also requires. By controlling the ethylene content in the ethylene-vinyl alcohol copolymer at

Application Number 10/532322
Response to the Office Action dated October 17, 2008

20 mol% or more, sufficient hardness to produce the heat-and-humidity gelling fiber and the nonwoven and chemical stability in the electrolytic solution can be obtained (see page 10, lines 2-16 of the specification). Also, by controlling the ethylene content at 50 mol% or less, the heat-and-humidity gelling temperature is not increased and thus, increase of the processing temperature, which may affect stability of the mean flow pore diameter and the bubble point pore diameter, is not necessary (see id.). Further, by controlling the fiber diameter of the heat-and-humidity gelling fiber at 1-6 µm, the heat-and-humidity gelling fiber can fix the other fiber without excessively filling of a gap between the fibers when the fiber becomes a gel material and spreads to form a film (see page 13, lines 24-27 of the specification). Thus, claim 33 is distinguished from Tsukuda.

Bahar discloses a composite membrane containing an expanded polytetrafluoroethylene membrane having a porous microstructure of polymeric fibrils and the bubble point test according to the ASTM F316 86 procedure, which provides an estimation of maximum pore size (see coln. 2, lines 39-44 and coln. 9, lines 40-48). Bahar, however, fails to disclose use of ethylene-vinyl alcohol copolymer as a heat-and-humidity gelling fiber included in the nonwoven and accordingly, fails to disclose the particular values of the ethylene content in the ethylene-vinyl alcohol copolymer and the diameter of the heat-and-humidity gelling fiber made of the ethylene-vinyl alcohol copolymer as claim 33 requires. Thus, Bahar does not remedy the deficiencies of Tsukuda.

Accordingly, claim 33 is distinguished from Tsukuda as evidenced by Bahar, and this rejection should be withdrawn.

Claims 33-43, 49-51, 53-56, and 63 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukuda et al. (International Patent Application Publication No. WO 98/32184), which corresponds to U.S. Patent No. 6,511,774, in view of Zucker (U.S. Patent Application Publication No. 2003/0113619), as evidenced by Bahar et al. (U.S. Patent No. 5,599,614). Applicants respectfully traverse this rejection.

Application Number 10/532322
Response to the Office Action dated October 17, 2008

Claim 33 and accordingly, claims 34-35, 37-43, 49-51, 53-56, and 63 are distinguished from Tsukuda as evidenced by Bahar for at least the same reasons as discussed above.

Zucker discloses battery separators that are made of a wettable, uniform mat of melt brown fibers and that an average pore size of the mat is 0.3-50 microns (see summary at para. [0007] at page 1). Zucker, however, fails to disclose use of ethylene-vinyl alcohol copolymer in the heat-and-humidity gelling fiber of the nonwoven and accordingly, the particular values of the ethylene content in the ethylene-vinyl alcohol copolymer and the diameter of the heat-and-humidity gelling fiber made of the ethylene-vinyl alcohol copolymer as claim 33 requires. Thus, Zucker does not remedy the deficiencies of Tsukuda and Bahar.

Accordingly, claim 33 is distinguished from Tsukuda in view of Zucker as evidenced by Bahar, and this rejection should be withdrawn.

Claims 44-46, and 52 have been rejected under 35 U.S.C. 103(a) as being unpatentable over either (a) Tsukuda et al. (International Patent Application Publication No. WO 98/32184), which corresponds to U.S. Patent No. 6,511,774, as evidenced by Bahar et al. (U.S. Patent No. 5,599,614) or (b) Tsukuda et al. in view of Zucker (U.S. Patent Application Publication No. 2003/0113619), as evidenced by Bahar et al. (U.S. Patent No. 5,599,614). Applicants respectfully traverse this rejection.

Claim 33 and accordingly, claims 44, 46, and 52 are distinguished from Tsukuda as evidenced by Bahar and Tsukuda in view of Zucker as evidenced by Bahar for at least the same reasons as discussed above. Accordingly, this rejection should be withdrawn.

Claims 46-48 and 50 have been rejected under 35 U.S.C. 103(a) as being unpatentable over either (a) Tsukuda et al. (International Patent Application Publication No. WO 98/32184), which corresponds to U.S. Patent No. 6,511,774, as evidenced by Bahar et al. (U.S. Patent No. 5,599,614) or (b) Tsukuda et al. in view of Zucker (U.S. Patent Application Publication No. 2003/0113619), as evidenced by Bahar et al. (U.S.

Application Number 10/532322
Response to the Office Action dated October 17, 2008

Patent No. 5,599,614), further in view of Tsutsui et al. (U.S. Patent Application Publication No. 2002/0037408). Applicants respectfully traverse this rejection.

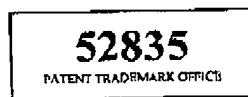
Claim 33 and accordingly, claims 46-48 and 50 are distinguished from Tsukuda as evidenced by Bahar or Tsukuda in view of Zucker as evidenced by Bahar for at least the same reasons as discussed above.

Tsutsui discloses a polyolefin splittable conjugate fiber including two components of polyolefin resins such as a polypropylene resin phase and a polyethylene resin phase (see paras. [0009]-[0010]). However, Tsutsui fails to disclose the particular diameter of the heat-and-humidity gelling fiber made of the ethylene-vinyl alcohol copolymer as claim 33 requires. Thus, Tsutsui does not remedy the deficiencies of Tsukuda and Bahar.

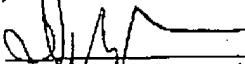
Accordingly, claims 46-48 and 50 are distinguished from Tsukuda as evidenced by Bahar and Tsukuda in view of Zucker as evidenced by Bahar and further in view of Tsutsui, and accordingly, this rejection should be withdrawn.

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

Respectfully submitted,



HAMRE, SCHUMANN, MUELLER &
LARSON, P.C.
P.O. Box 2902
Minneapolis, MN 55402-0902
(612) 455-3800

By: 

Douglas P. Mueller
Reg. No. 30,300

Dated: January 16, 2009

DPM/my/ad